## Patent Claims:

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A sensor arrangement 1.

having a plurality of sensor devices formed on and/or in a substrate, each of the sensor devices having

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- an electrical signal converter;
- a sensor element coupled to the signal converter, sensor element can be influence the electrical characteristically conductivity of the signal converter on account of a sensor event on the sensor element;
- device for keeping constant electrical an voltage present at the signal converter;
- a device for detecting the value of the electric current flowing through the signal converter as 15 sensor signal.
- The sensor arrangement as claimed in claim 1, 2. the electronic signal converter is which 20 transistor.
- The sensor arrangement as claimed in claim 1 or 2, in which the electronic signal converter is a fieldeffect transistor whose gate terminal is coupled to the sensor element, the device for keeping constant an 25 electrical voltage being set up in such a way that it keeps constant the electrical voltage between source/drain terminals of the field-effect transistor.
- The sensor arrangement as claimed in one of claims 30 4. 1 to 3, having an evaluation unit, which is provided with the value of the electric current as sensor signal.
- The sensor arrangement as claimed in claim 4, 35 in which the evaluation unit is set up in such a way that it forms, from the value of the electric current, an electrical voltage characteristic of this value or

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maps the value of the electric current onto a digitally coded value that characterizes the latter.

- 6. The sensor arrangement as claimed in claim 5,
- 5 in which the evaluation unit has an operational amplifier
  - having a first input, to which the sensor signal can be applied;
- having a second input, to which an electrical
  reference potential can be applied;
  - having an output, at which the characteristic electrical voltage is provided;
  - the first input and the output being coupled to one another by means of a nonreactive resistor.
  - 7. The sensor arrangement as claimed in one of claims 1 to 6, configured as a biosensor arrangement.
- 20 8. The sensor arrangement as claimed in one of claims 3 to 7, which has a calibration device for calibrating a respective sensor device, which is set up in such a way that it can be used to bring the gate region of the 25 field-effect transistor to an electrical calibration potential such that the electric current is independent of parameter fluctuations of the field-effect transistor.
- 30 9. The sensor arrangement as claimed in claim 8, in which the calibration device is set up in such a way that an electric calibration current can be applied to the gate terminal and to a source/drain terminal of the field-effect transistor for calibration purposes.
  - 10. The sensor arrangement as claimed in one of claims 4 to 9,
  - in which the evaluation unit has a correlated double

sampling device, which is set up in such a way that it forms, in the case of a sensor event, a value of the electric current that is independent of parameter fluctuations of the field-effect transistor.

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- 11. The sensor arrangement as claimed in claim 10, in which the correlated double sampling device is set up in such a way that, by means of this device,
- in a calibration phase, the gate region of the brought field-effect transistor is to an 10 the potential and electrical calibration value of the electric current is associated detected as calibration signal and stored;
- in a detection phase, the value of the electric
  current on account of a sensor event is detected as sensor signal;
  - in an evaluation phase, sensor signal and calibration signal are evaluated jointly.
- 20 12. The sensor arrangement as claimed in one of claims 1 to 11,

in which the sensor devices are arranged essentially in matrix form on and/or in the substrate and are connected up by means of row and column lines in such a way that the sensor devices can be driven individually, row by row or column by column.

- 13. The sensor arrangement as claimed in claim 12, in which at least one evaluation unit, at least one 30 calibration device and/or at least one correlated double sampling device are/is provided jointly for at least a portion of the sensor devices of a row line or a column line.
- 35 14. A method for operating a sensor arrangement
  - with a sensor arrangement having a plurality of sensor devices formed on and/or in a substrate, each of the sensor devices having

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- o an electrical signal converter;
- o a sensor element coupled to the signal converter, which sensor element can be used to characteristically influence the electrical conductivity of the signal converter on account of a sensor event on the sensor element;
- o a device for keeping constant an electrical voltage present at the signal converter;
- o a device for detecting the value of the electric current flowing through the signal converter as sensor signal;
- in which case, in accordance with the method,
  - o the electrical conductivity of the signal converter is characteristically influenced on account of a sensor event on the sensor element;
  - o the electrical voltage at the signal converter is kept constant;
- o the electric current flowing through the signal converter is detected as sensor signal.
- 15. The method as claimed in claim 14, in which a field-effect transistor whose gate terminal is coupled to the sensor element is used as the electronic signal converter, the electrical voltage between the source/drain terminals of the field-effect transistor being kept constant.
  - 16. The method as claimed in claim 15,
- in which at least a portion of the sensor devices is calibrated by the gate region of the respective field-effect transistor being brought to an electrical calibration potential such that the value of the electric current in the case of a sensor event is independent of parameter fluctuations of the field-effect transistor.
  - 17. The method as claimed in claim 15,

in which a value of the electric current that is independent of parameter fluctuations of the fieldeffect transistor is formed using the correlated double sampling method in the case of a sensor event.